

BAB V

KESIMPULAN DAN SARAN

5.1. Simpulan

Berdasarkan hasil penelitian optimasi menunjukkan bahwa etanol berpengaruh untuk menurunkan viskositas, menurunkan daya sebar dan mempercepat waktu kering. Gliserin berpengaruh untuk meningkatkan viskositas, meningkatkan daya sebar tetapi memperlama waktu kering. HPMC berpengaruh untuk meningkatkan viskositas, menurunkan daya sebar, memperlama waktu kering. Interaksi ketiganya berpengaruh meningkatkan viskositas, tetapi menurunkan daya sebar dan waktu kering.

Hasil optimasi memberikan formula optimum pada masker gel *peel-off* ekstrak kering buah pepaya (*Carica papaya* L.) yang diperoleh dengan *design expert* yaitu kombinasi etanol 10,33%, gliserin 7,82% dan HPMC 0,85% dengan perkiraan hasil viskositas 28977,497 cPs, daya sebar 5,673 cm dan waktu kering 15,47 menit.

5.2. Saran

Perlu dilakukan pengembangan metode evaluasi terukur menggunakan alat pada efektivitas kekencangan, elastisitas dan kemudahan dilepaskan sehingga hasil yang diperoleh lebih valid.

DAFTAR PUSTAKA

- Addai, Z.R., Abdullah, A., Mutalib, S.A., Musa, K.H. and Dougan, E.M.A. 2013, Antioxidant Activity and Physicochemical Properties of Mature Papaya Fruit (*Carica papaya* L. cv. Eksotika), *Journal of Food Science and Technology*, **5(7)**: 859-865.
- Agache P., Mary S., Muret P., Matta A. M., Humbert P., 2001, *Assessment of the Water Content of the Stratum corneum Using a SorptionDesorption Test*, Dermatology Unit, Laboratory of Engineering and Cutaneous Biology, University Hospital, France.
- Anonim, 1999, *AQUALON Sodium Carboxymethylcellulose: Physical and Chemical Properties*, Hercules Incorporate, USA.
- Arham, R., Mulyati, M. T., Metusalach, M. dan Salengke, S. 2016, Physical and Mechanical Properties of Agar Based Edible Film With Glycerol Plasticizer, *International Food Research Journal*, **23(4)**: 1669-1675.
- Aswal, A., Kalra, M. and Rout, A. 2013, Preparation and Evaluation of Polyherbal Cosmetic Cream, *Der Pharmacia Lettre*, **5(1)**: 83-88.
- Backer, C.A. 1965, *Flora of Java*, Vol. 2, Noordhoff Gronigen, Netherlands.
- Badan Pengawas Obat dan Makanan RI, 2011^a, *Acuan Sediaan Herbal*, Vol. 6, Edisi 1, Badan Pengawasan Obat dan Makanan RI, Jakarta.
- Badan Pengawas Obat dan Makanan Republik Indonesia, 2011^b, *Peraturan Kepala Badan Pengawas Obat dan Makanan no. Hk. 03.1.23.12.11.10052 tahun 2011 tentang Pengawasan Produksi dan Peredaran Kosmetika*, Jakarta.
- Barel, A. O., Paye M., Maibach, H. I., 2009, *Handbook of Cosmetic Science and Technology*, 3rd ed., Informa Healthcare USA Inc, New York, USA.
- Bauernfeind, J.C. 1981, *Carotenoids as Colorants and Vitamin A Precursors*, Academic Press, pp. 33-34, 179-181, 189, 816-821.

- Bergo, P., and Sobral, P.J.A. 2007, Effect of Plasticizers on Physical Properties of Pigskin Gelatin Films, *Food Hydrocolloids*, **21(8)**:1285-1289.
- Beringhs, O.A., Julia, M.R., Hellen, K.S., Rosane, M. B. and Diva, S. 2013, *Green Clay and Aloe Peel-Off Facial Masks: Response Surface Methodology Applied to the Formulation Design*, *American Association of Pharmaceutical Scientists PharmSciTech*, **14(1)**:445.
- Bertuzzi, Maria A., Gottifredi, Juan C. and Armada, Margarita, 2012, Mechanical Properties of a High Amylose Content Corn Starch Based Film, Gelatinized at Low Temperature, *Brazilian Journal of Food Technology*, **15(3)**:219-227.
- Bolton, S. 1990, *Pharmaceutical Statistics Practical and Clinical Applications*, 2nd ed., Vol 44, Marcel Dekker, Inc., New York.
- Buhse, N. 2004, *Modern Technology of Cosmetics*, Asia Pacific Business Press, New Delhi, p482.
- Cadenas, E. and Packer, L. 2002, *Handbook of Antioxidants*, Marcel Dekker Inc., New York.
- Caparino, O.A., Tang, J., Nindo, C.I., Sablani, S.S., Powers, J.R. and Fellman, J.K. 2012, Effect of Drying Methods on the Physical Properties and Microstructures of Mango (Philippine ‘Carabo’ var.) Powder, *Journal of Food Engineering*, **3**:135-148.
- Cho, S., Lee, D. H., Won C-H., Kim, S. M., Lee, S., Lee, M. J., Chung, J.H. 2010, ‘Differential effects of low-dose and high-dose betacarotene supplementation on the signs of photoaging and type I procollagen gene expression in human skin in vivo’, *Dermatology*, **221(2)**:160-171.
- Contreras, M.D. and Sanchez, R. 2002, Application of factorial design to the study of the flow behavior, spreadability and transparency of a Carbopol ETD 2020 gel. Part II, *International Journal of Pharmaceutics*, **234**: 139-147.

- Departemen Kesehatan Republik Indonesia, 1985, *Formularium Kosmetika Indonesia*, Departemen Kesehatan Republik Indonesia, Direktorat Jendral POM, Jakarta.
- Departemen Kesehatan RI, 1995, *Farmakope Indonesia*, 4th ed., Departemen Kesehatan Republik Indonesia, Jakarta.
- [Dirjen POM RI]. Direktorat Jenderal Pengawasan Obat dan Makanan RI, 1989, *Materia Medika Indonesia*, 5th ed., Departemen Kesehatan Republik Indonesia, Jakarta.
- [Dirjen POM RI], Direktorat Jenderal Pengawasan Obat dan Makanan RI, 2000, *Parameter Standar Umum Ekstrak Tumbuhan Obat*, Departemen Kesehatan Republik Indonesia, Jakarta.
- Departemen Kesehatan RI, 2012, *Vademekum Tanaman Obat*, Jilid 3, Kementerian Kesehatan RI, Jakarta.
- Departemen Kesehatan RI, 2014, *Farmakope Indonesia*, 5th ed., Departemen Kesehatan Republik Indonesia, Jakarta.
- Desai, UT., & Wagh, AN., 1995, *Papaya In Handbook of Fruit Science and Technology Production, Composition, Storage, and Processing*, Marcel Dekker, Inc, New York.
- Evans, J.A. and Johnson, E.J. 2010, The Role of Phytonutrients in Skin Health, *Nutrients*, **2**: 903-928.
- Ferida, T., 2011, 'Penggunaan Sari Buah Pepaya (*Carica papaya L.*) dalam Sediaan Krim Pelembab', *Skripsi*, Sarjana Farmasi, Universitas Sumatera Utara.
- Garg, A., Aggarwal, D., Garg, S. and Singla, A. K. 2002, *Spreading of Semisolid Formulation: an Update*, PharmTech, India.
- Gaudin, S., Lourdin, D., Botlan, D. L., Ilari, J.L., and Colonna, P. 1999, Plasticization And Mobility In Starch-Sorbitol Films, *J. Cereal Sci.*, **29(3)**: 273–284.

- Grace, X.F., Darsika, C., Sowmya, K.V., Suganya, K., Shanmuganathan, S. 2015, Perparation and Evaluation of Herbal Peel off Face Mask, *American Journal of Pharmtech Research*, **5(4)**: 332-336.
- Gritter, R. J., Bobbit, J. M. and Schwarting, A. E. 1991, *Pengantar Kromatografi*, 2nd ed., Diterjemahan oleh Kosasih Padmawinata, Penerbit ITB, Bandung.
- Gross, J. 1987, *Pigments In Fruit*, Academic Press, London.
- Gross, J. 1991, *Pigments In Vegetables (Chlorophylls and Carotenoids)*, Van Nostrand Reinhold, New York.
- Harris, H. 2001, Kemungkinan Penggunaan *Edible Film* dari Tapioka untuk Pengemas Lempuk, *Jurnal Pertanian Indonesia* **3(2)**: 99-106.
- Hassan, C.M. dan Peppas N.A. 2000, Structure and Applications of Poly(vinyl alcohol) Hydrogels Produced by Conventional Crosslinking or by Freeze/Thawing Methods, *Advances in Polymer Science*, **153**: 38-65.
- Heldman, D. dan Singh R. 1981, *Food Processing Engineering*, AVI Publishing Company, USA.
- Herawati, R., 2006, 'Pengaruh Gliserin terhadap Stabilitas Fisik dan Efektivias Ekstrak Kering *Aloe vera* sebagai Pelembab dalam Basis Vanishing Cream', *Skripsi*, Sarjana Farmasi, Universitas Airlangga, Surabaya.
- Inglet and Charalambous, 1979, *Tropical Foods:Chemistry and nutrition*, From Academic Press, Jakarta.
- Jayronia, S. 2016. Design and Development of Peel-off Mask Gel Formulation of Tretinoin for Acne Vulgaris. *World Journal Of Pharmacy And Pharmaceutical Sciences*, **5(11)**: 928-938.
- Jones, D.S. 2010, *Statistik Farmasi*, Diterjemahkan dari Bahasa Inggris oleh Hesty U. Ramadaniati dan H. H. Rivai, N. Aini (ed.), Penerbit Buku Kedokteran EGC, Jakarta.

- Juan P. C., Veronica L.MD., Bertha T.A., and Benjamin M.MD. 2003. A Simple Measure For Applying Sunscreen While On Holidays, *Dermatology Online Journal* **9(3)**: 23.
- Kartika, B. 1991, *Pedoman Uji Inderawi Bahan Pangan*, Proyek Peningkatan Perguruan Tinggi Universitas Gajah Mada, Yogyakarta.
- Kibbe, A. H., 2004, *Handbook of Pharmaceutical Excipients*, Third Edition, 18-19, 462-469, 629-631, Pharmaceutical Press, London.
- Kurniawan, D.W., dan Sulaiman, S.T.N., 2009, *Teknologi Sediaan Farmasi*, Graha Ilmu, Yogyakarta.
- Kusantati, H., Prihatin, P. T. & Wiana, W. 2008, *Tata Kecantikan Kulit*, Jilid 1, Direktorat Pembinaan Sekolah Menengah Kejuruan, Jakarta.
- Lachman, L., Lieberman, A.L. and Joseph, L. K. 1994, *Teori dan Praktek Farmasi Industri*, 3rd ed., UI Press, Jakarta.
- List, P. H. and Schmidt, P. C., 1989, *Phytopharmaceutical Technology*, Heyden & Son Limited, London.
- Lokapure, S.G., Salunkhe, S.D., Shenekar, P.N., Sutar, S.T., Ukirade, P.S., Mohite, S.K. and Magdum, C.S. 2013, In Vitro Evaluation Of SPF, Photostability And Chemical Stability Of Carica Papaya L. Fruit Extract Gel, *Pelagia Research Library Der Pharmacia Sinica*, 2013, **4(6)**:43-47.
- Macinga, D.R., Edmonds, S.L., Campbell, E., Shumaker, D.J. and Arbogast, J.W. 2013, Efficacy of Novel Alcohol-Based Hand Rub Products at Typical In-Use Volumes, *Infection Control and Hospital Epidemiology*, **34(3)**: 299-301.
- Marthur, R.B.L. 1975, *Handbook of Cane Sugar Technology*, Oxford and IBH Publishing Company, New Delhi, Bombay, Calcuta.
- Martin, A.N., Swarbick, J., and Cammarata, A. 1993, *Physical Pharmacy*, 2nd ed., Lea & Febiger Publisher, London.

- Mathlouthia, M., and Genotelleb, J., 1998, *Role of Water in Sucrose Crystallization*, pp.335-342.
- Milind, P. and Gurditta, 2011, Basketful Benefits of Papaya, *International Research Journal of Pharmacy*, **2(7)**: 6-12.
- Miswar., Sugiharto, B., Handoyo., T., dan Made, D.S.A. 2007, Peranan Sucrose Phosphate Synthase (SPS) dan Acid Invertase (AI) Internoda Tebu (*Saccharum officinarum* L.) dalam Akumulasi Sukrosa, *Agritrop*, **26(4)**: 187-193.
- Mitsui, T. 1997, *New Cosmetic Science*, Elsevier Science, The Netherlands.
- Moore, K., and Agur, Anne, 2002, *Anatomi Klinik Dasar*, Hipokrates, Jakarta.
- Nawanopparatsakul, S., Eusathien, J., Eamtawecharum, C., Benjasirimingokol, P., Soiputtan, S., and Pacchamud, P.T. 2005, Skin Irritation Test of Curcuminoids Facial Mask Containing Chitosan as a Binder, *Silpakorn University International Journal*, **7(1-2)**: 140-147.
- Oboh, G., Ademosun, A.O., Akinleye, M., Omojokun, M.A., Boligon, A.A., Athayde, M.L. 2015, Starch Composition, Glycemic Indices, Phenolic Constituents and Antioxidative and Antidiabetic Properties Of Some Common Tropical Fruits, *Journal of Ethnic Food*, **2**: 62-73.
- Ogur, E. 2005. *Polyvinyl Alcohol: Materials, Processing and Applications*, Smithers Rapra Technology, United Kingdom.
- O'Neil, M.J., Heckelman, P.E., Koch, C.B., Roman, K.J., Kenny, C.M. and D'Arecca, M.R. 2006, *The Merck Index*, Merck & Co., Inc, USA.
- Park, J.H., Kyong, K.Y., Kwak, T.J., Yoon, M.S., Kang, S.H. 1999, Effect of Plasticizers on The Properties of Cosmetic Mask Using Polyvinyl Alcohol (PVA) as A Film Former, pp.51-55.
- Patogi, 2008, Kulit Kering, *Karya Tulis Departemen Ilmu Kesehatan Kulit dan Kelamin*, Fakultas Kedokteran, Universitas Sumatra Utara.

- Prastiwi, S. 2005, 'Penetapan kadar karoten dalam wortel (*Daucus carota* L.) yang ditanam di desa nangkajajar, pasuruan dan desa junggo, kota Batu secara spektrofotometri', *Skripsi*, Sarjana Farmasi, Universitas Katolik Widya Mandala, Surabaya.
- Prawirokusumo, S. 1991, *Biokimia Nutrisi (Vitamin)*, Ed.1, BPFE, Yogyakarta.
- Proserpio, G., 1981, *L'ape cosmetica Erboristeria Domani Libri*, Milano, Italia. p139.
- Pu-you, Ji., Cai-ying, B., Li-Hong, H.,Yong-hong, Z., 2014, Properties of Poly(vinyl alcohol) Plasticized by Glycerin, *Journal of Forest Products and Industries*, **3(3)**: 151-153.
- Purwiyatno, H. 2013, Freeze Drying Technology : for Better Quality & Flavor of Dried Products, *Food Review Indonesia*, **8(2)**: 52-57.
- Reed, T., Barret, A.H., Briggs, J., and Richardson, M. 1998, Texture and Storage Stabilyty of Processed Beefstick as Affected by Glycerol and Moisture Level, *Journal Food Science* **63**: 84-87.
- Reiger, M.M. (eds). 2000, *Harry's Cosmeticology*, 8th ed., Chemical Publishing Co., Inc., Western Avenue, USA.
- Rekso, G. T., dan Sunarni, A. 2007, Karakteristik Hidrogel Polivinil Alkohol Kitosan Hasil Iradiasi Sinar Gamma, Pusat Aplikasi Teknologi Isotop dan Radiasi, Jakarta.
- Rowe, R.C., Sheskey, P.J and Owen, S.C. 2006, *Handbook of pharmaceutical excipients*, 5th ed., Washington DC: Pharmaceutical Press and American Pharmacist Association.
- Rowe, R.C., Sheskey, P.J. and Quinn, M.E. (eds.), 2009, *Handbook of Pharmaceutical Excipients*, 6th ed., Pharmaceutical Press, London.
- Saxena, S.K. 2004, *Polyvinyl Alcohol (PVA)*, Chemical and Technical Assesment (CTA), JECFA.

- Saini, R., Mittal, A. dan Rathi, V. 2016, Formulation & *In-Vitro* Antioxidant Analysis Of Anti-Ageing Cream Of *Carica Papaya* Fruit Extract, *Indian Journal of Drugs*, **4(1)**:8-14.
- Saifudin, A., Rahayu, V., dan Teruna, H. 2011, *Standarisasi Bahan Obat Alam* Edisi I, Graha ilmu, Yogyakarta.
- Sastrohamidjojo, H. 2002, *Kromatografi*, Cetakan ketiga, Liberty, Yogyakarta, pp.28–29.
- Sherwood, L. 2009, *Fisiologi Manusia dari Sel ke Sistem*, Edisi 6, Penerbit Buku Kedokteran EGC, Jakarta.
- Sies, H. and Stahl, W. ‘Carotenoids and UV protection’, *Photochemical and Photobiological Sciences*, **3(8)**:749-752.
- [SDA], Soap and Detergent Association, 1990, *Glycerine: an Overview, Glycerine and Oleochemical Division*, New York.
- Steenis, C.G.G.J. 2008, *Flora*, Diterjemahkan dari Bahasa Belanda oleh Surjowinoto, Penebar Swadaya, Jakarta.
- Sudarmadji, S. 2010, *Analisa Bahan Makanan dan Pertanian*, Yogyakarta, Liberty.
- Sudarmaji, Slamet, Haryono, Bambang dan Suhardi, 1997, *Prosedur Analisa Untuk Bahan Makanan dan Pertanian*, Liberty, Yogyakarta.
- Suryanto, Husna, N., Purba, D. 2012. Efek Pelembab Minyak Biji Bunga Matahari Dalam Sediaan Krim Tangan, *Journal of Pharmaceutics and Pharmacology*, **(1)1**: 63-69.
- Supriyono, T. 2008, ‘Kandungan Beta Karoten, Polifenol Total dan Aktivitas ”Merantas” Radikal Bebas Kefir Susu Kacang Hijau (*Vigna radiata*) Oleh Pengaruh Jumlah Starter (*Lactobacillus bulgaricus* dan *Candida kefir*) dan Konsentrasi Glukosa’, *Thesis*, Universitas Diponegoro, Semarang.
- Svensson, L. 2012, *Design and performance of Small scale sensory consumer tests, Second cycle, A2E*, SLU, Dept. of Food Science, Uppsala.

- Tranggono, R.I. dan Latifah, F. 2007, *Buku Pegangan Ilmu Pengetahuan Kosmetik*, Penerbit Gramedia Pustaka Utama, Jakarta.
- Tresna, P. 2010, *Perawatan Kulit Wajah (Facial)*, Universitas Pendidikan Indonesia, Bandung.
- Untalan, M.K.C., Perez, I.F.R., Reyes, G.H., Escalona, K.M.H., Guzman, L.D.D., and Lumanglas, R.F.L. 2015, Proximate Analysis and Antioxidant Properties of Selected Fruits in Batangas, *Asia Pasific Journal of Multidisciplinary Research*, **3(4)**: 41-45.
- Vieira, R. P., Fernandes, A. R., Kaneko, T. M., Consiglieri, V. O., Pinto, C. A. S., Pereira, C. S. C., Baby, A. R., and Velasco, M. V. R., 2009, Physical and Phisicochemical Stability Evaluation of Cosmetic Formulation Containing Soybean Extract Fermented by Bifidobacterium Animalis, *Journal of Pharmaceutical Sciences*, **45(3)**: 515-525.
- Voight, R. 1995, *Buku Pelajaran Teknologi Farmasi*, cetakan ke-2, Diterjemahkan dari Bahasa Inggris oleh Noerono, S. dan Reksodiprojo, M.S. Universitas Gajah Mada, Yogyakarta, pp.558-584.
- Ward, J. B. and Sperandio, G. J. 1964, Cosmetic applications of polyvinyl alcohol, *Journal of the Society of Cosmetic Chemist*, **15**: 327-335.
- Wasitaatmadja, S. M. 2010, Anatomi Kulit, Dalam: Djuanda, A., Hamzah, M., Aisah, S. *Ilmu Penyakit Kulit dan Kelamin*, ed.6, Fakultas Kedokteran, Universitas Indonesia, Jakarta.
- Wathoni, N., Soebagio, B., dan Rachim, A.M., 2009, Formulasi gel antioksidan kitosan dengan menggunakan basis aquapec 505 HV, *Farmaka*, **7(3)**: 9-26.
- Wilkinson, J.B. and Moore, R.J. 1982, *Harry's Cosmeticology*, 7th ed., George Godwin, London.
- Williams, 2001, *Food Experimental Prespectives*, 4th ed., Prentice Hall, Inc. New Jersey.

- Wojciechowska, P. 2012, 'The Effect of Concentration and Type of Plasticizer on the Mechanical Properties of Cellulose Acetate Butyrate Organic-Inorganic Hybrids', in Luqman, M., *Recent Advances in Plasticizers*, 141-164.
- Yanhendri. dan Yenny, S.W. 2012, Berbagai Bentuk Sediaan Topikal dalam Dermatologi, *CDK*, **39(6)**: 423-430.